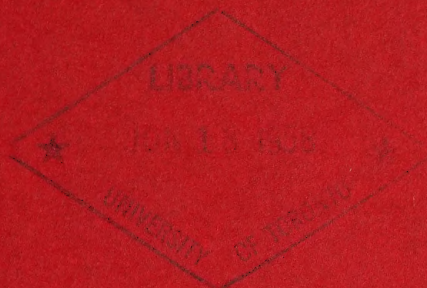
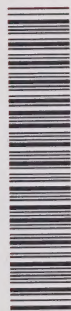


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Canada Mines and Technical Surveys
Dept. of Explosives Division



The Storage of EXPLOSIVES



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1958 ed.

Department of Mines and
Technical Surveys, Ottawa
EXPLOSIVES DIVISION

EDMOND CLOUTIER, C.M.G., O.A., D.S.P.
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Canada

The Storage of EXPLOSIVES

Department of Mines and
Technical Surveys, Ottawa
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INTRODUCTION

The storage of explosives has an important bearing, not only on the efficiency of the explosives, but on the safety of the public and of those in whose charge they may be. This pamphlet reviews briefly the main considerations that should be borne in mind when providing for the storage of explosives. These are largely dependent on the quantity of explosives to be stored, on whether the building is to be permanent or temporary, on local conditions and on available building materials.

When the quantity of explosives to be kept does not exceed 150 pounds of dynamite or gunpowder, or 2,000 detonators, satisfactory provision may be made for storage in detached buildings, or locked receptacles, under conditions to which reference will be made later. First to be considered is the storage of larger quantities in buildings, permanent or temporary, properly called "magazines".

MAGAZINES

Isolation of Magazines for Public Safety

The first question to be decided by anyone proposing to build a magazine should be its location. A magazine should be so situated that the accidental explosion of its contents is not likely to cause any serious damage to other buildings, or injury to persons. It is reasonable also to provide for some variation in the degree of isolation, having regard to the nature of the risks. The minimum distances to which a magazine must be removed from other buildings or places are dependent on the maximum quantity of explosives stored in the magazine at any one time. In this country the revised British "Table of Distances", compiled from a study of the effects of recorded explosions, is taken as a guide in determining the site for a magazine for a given amount of explosives. A short abstract of this table is given in Appendix A. *These are minimum distances, and greater distances should be observed whenever possible.* Attention should be paid to the possibility of finding a site that will protect, by intervening high ground, any buildings or roads in the vicinity.

Protection Against Lightning and Fire

If a magazine is situated close to a high bank it is not only shielded from other buildings, but the chances of its being struck by lightning are much reduced. Whether so situated or in open flat country, magazines may be provided with lightning conductors. Some large magazines are so equipped, but this is not general practice. To be effective, the installation of lightning conductors must be carried out by a competent person, their design must be good, the material suitable, sharp bends avoided, and good grounding ensured. They should be tested periodically, as there is a danger of the effectiveness of the earth contact falling off, and so defeating the purpose of the conductors.

There is more cause in this country to fear bush fires than electric storms, so scrub should always be cleared around a magazine as protection against ground fires. If a magazine is situated in bush country it should be built of brick, concrete, or other fire-resistant material. An instance is known where a bush fire swept over such a magazine, leaving it and its contents unharmed.

Security of a Magazine

No magazine can be made completely proof against unlawful entry. Although thefts from well-built magazines are not unknown, they are more likely to occur from magazines which may be forced without great difficulty. A magazine intended for permanent use should be of substantial construction and designed to prevent break-ins.

Structural security should be greatest in a permanent magazine which is isolated. The double-brick wall type has been extensively adopted, although in recent years, concrete and cement block construction have found favour. A double plank (2-inch) door faced with $\frac{3}{8}$ -inch boiler plate and fitted with a strong mortice lock (preferably with two locks) will provide good security. For a semi-permanent magazine a double-walled frame building covered with galvanized iron is suitable, and when the walls are filled with sand, the magazine is rendered bullet proof. Substitution of fire-resistant roofing paper for galvanized iron on the outside, although not adding to the strength of the building, will act as a preservative and lessen the fire hazard.

In logging districts good serviceable small magazines may be built with flattened or "slabbed" logs, provided care is taken to avoid any spaces between the logs. The practice of constructing

small magazines in a bank, in the form of a dug-out, is unwise because of the risk of dampness. The magazine would better be built clear of the bank but in its shelter.

A few plans of magazines of different types are given in Appendix B. These are not intended as specifications which must be rigidly adhered to, but as illustrations of how, with different materials and under different conditions, adequate magazines may be constructed. If 500 pounds or less are to be stored, a bin-type structure such as is illustrated in Appendix C should be considered.

Other Features of Magazine Building

The interior of a magazine should be kept scrupulously clean; it should be reserved exclusively for the storage of the explosives (save for such articles as brooms, magazine shoes, and mats); there should be no exposed nails or iron.

Clean Storage. In furtherance of cleanliness the walls and floor should present a smooth finish. This may be done by using close tongue-and-groove boarding, or the walls may be lined with composite board sheathing or other material giving a smooth, even surface where dust cannot collect, and which can be easily cleaned. A good practice is to round off the junction between walls and floor with curved moulding. This helps to prevent the collection of dust around the edges and corners and also is a check against the undesirable practice of piling cases close to the walls. In cement magazines a good surface can be obtained with a finish of neat cement which may be rounded off at the junction of walls and floor.

Given a condition that lends itself to ease in cleaning, steps should also be taken to exclude dirt, hence the provision of a doormat and shoes, or overshoes, to be kept in the building for the use of anyone entering. A convenient arrangement, which is shown in the plans, is to have a barrier between which and the main entrance may be kept mat, shoes, broom, mallet and wedge, and where also a peg may be fixed on which to hang an overcoat. If, instead of a simple barrier, a dividing wall with door and lock is built, greater security is afforded. A copy of the magazine rules, and a notice giving the maximum quantity of explosives which may be kept in the magazine, should be posted in this entrance chamber.

Ventilation. Explosives must be kept dry and as cool as possible; it is therefore vitally important that a magazine be well ventilated, preferably by cross-ventilation. Two to four wall vents 2 inches to 3 inches in diameter, above the flooring, and the same number near the ceiling will provide good cross-ventilation. These vents should be made with double elbow bends—that is, two right-angled turns in the thickness of the wall—so that the aperture on the outside is lower than that inside. They should be protected by a small mesh screen near the outer end to exclude dirt and a stronger grid farther in beyond the bends, as an obstacle to the malicious insertion of a fuse. This grid may be so placed as to render its cutting practically impossible unless a part of the wall be broken away. In a sand-filled double-wall building a vent may be readily made with pipe elbow joints. In small double-frame, unfilled, magazines there is no need of a conduit, but the hole in the inner wall should be bored a few inches above that in the outer, and the strong grid fixed to the inner, the fine mesh screen to the outer.

The practice of leaving openings in the walls at floor level, or in the floor itself, to permit circulation of air is dangerous and not recommended. Dust, including explosive matter tends to collect below the floor, and openings so situated encourage the practice of sweeping outwards, instead of sweeping inwards and collecting and destroying the dust.

The use of roof vents is also undesirable, as it has been found difficult to screen them effectively against malicious action of vandals, and the entry of birds, animals, windborne snow, sand or dust.

Maintenance of Magazines

Given a magazine so constructed that it is easy to keep clean, the owner should make certain it is kept clean. Foremost among standing orders given by the owner to his employees should be those regarding:

1. Exclusion of open lights or matches.
2. Cleanliness of shoes on entering.
3. Habitual use of a broom.

If a magazine has been built to a size suitable for the maximum quantity of explosives to be stored in it, there should be no occasion to pile the cases too high, even when a variety of brands

are dealt with and are stacked separately. Cases should never be piled higher than would enable a man standing on the floor to handle a case on the top tier without difficulty.

Attention should be directed to the turnover of stock—the older stock being issued first. There is always the tendency, when stock is low, and a new supply is taken into the magazine, for the remainder of the old stock to be left at the back, and the cases nearest to hand issued.

Nitroglycerine explosives, such as the dynamites, are liable to “sweat”. This sweating is the exudation of nitroglycerine, and although greatly induced by storage in a moist atmosphere, it occurs sometimes under good conditions of storage. This is a condition which slightly reduces the effectiveness of the explosive, but what is more important, it *renders it more sensitive to friction* and yet more difficult of detonation in ordinary use. If the exudation is only slight, and the cartridges are used, it is advisable to employ a stronger detonator than would normally be taken—e.g. a No. 8 instead of a No. 6. Beads of nitroglycerine form on the outside of the cartridges, and after a time the exuded nitroglycerine will soak the bottom and lower parts of the sides of the cases, staining them noticeably. The sweating may be observed at an earlier stage if there has been occasion to open cases. In either event the cartridges in all affected cases should be examined, and if still serviceable, taken for early use. *They should not be issued unless the party receiving them understands their condition.* If the sweating is so great that the cartridges are unserviceable, they should be destroyed by burning. If marked exudation has been found under good storage conditions it should be reported to the manufacturer or dealer who supplied them, and his guidance sought regarding their disposal.

In most instances when exuding cartridges have been found in dry magazines, the cause has been traced to the return of the explosives to the magazine without examination and the probability that they were previously held under improper conditions. This may apply to the return by customers of left-over explosives, accepted by a dealer wishing to oblige his customers; or to the returns made by detached working parties, as in construction work, river driving or logging, to their own main supply magazine. Therefore, any person in charge of a magazine should give careful scrutiny to all old explosives he is asked to take into store.

Where exudation has occurred in a magazine and has seeped from the cases to the floor, the stained part should be thoroughly cleaned with a special preparation for the removal of nitroglycerine. Such a cleanser may be made by dissolving one pound of caustic soda, or Gillet's lye, in about one and a quarter pints of water and adding a gallon of wood alcohol. If the latter is not obtainable, then methylated spirits may be substituted.

Cases of explosives should never be opened in a magazine. If a case has to be opened it should be removed to some distance from the magazine, and opened with a hardwood wedge and mallet or hammer of soft metal, which should be kept in the magazine for use when required. Iron tools should never be used. The cover of the case should be replaced before returning the case to the magazine.

The cylindrical canisters containing gunpowder or black sporting or blasting powders should be stacked on their sides or, if more convenient, on their ends with the bungs down. They should be rolled over, and if necessary shaken but never knocked, every two or three months as a safeguard against caking of the powder.

"NITRAMON" and "NITRONE" have recently come into use. They are called "blasting agents" by the manufacturers and are much less sensitive to shock and friction than are nitroglycerine explosives. In use, they require a special primer for detonation. In spite of low sensitivity "Nitramon" and "Nitrone" are nevertheless explosives within the meaning of the Explosives Act and must be stored under magazine conditions. With respect to the Table of Distances however, three pounds of "Nitramon" or "Nitrone" may be considered as equivalent to one pound of nitroglycerine explosives. This relaxation applies *only* when the magazine contains no primers or other explosives.

DESTRUCTION OF EXPLOSIVES

Burning offers a simple and satisfactory way of disposing of blasting explosives, except black powder which should be disposed of by drowning in deep water. In disposing of blasting explosives by burning, great care must be taken to ensure that no detonators or electric blasting caps are among the explosives to be burnt. The cartridges should be laid, slightly overlapping, on a train of straw, hay or excelsior followed by fuse, paper or shavings laid in continuation of the line of cartridges and long

enough so that a person can get 100 yards clear before the explosives ignite. Kerosene (coal oil) sprinkled on the powder and train will ensure ignition of the powder. The whole should be placed so as to burn against the wind. If burned with the wind, it is possible that the fire will spread so rapidly through the mass as to cause a development of heat sufficient to bring about an explosion.

Primed cartridges should never be burned, but should be destroyed separately by exploding them at a carefully selected place.

After burning, care must be taken to see that no smouldering embers remain, and that all the explosive has been consumed. Unless absolutely necessary the same ground should not be used again, but if this has to be done, it should be well watered. The clinker-like residue sometimes found is harmful to livestock and should be gathered up and buried or thrown into deep water.

Never bury old explosives, as the nitroglycerine contained in them does not deteriorate with time but maintains its explosive force. Many instances have occurred in which men have lost their lives through the explosion of nitroglycerine that had lain for more than 20 years in the ground, in crevices of the rocks, or under water.

Before destroying any large quantities of explosives it is advisable to consult the Explosives Division, Ottawa, as to the best method, as there may be factors that require special treatment.

DETONATORS

Detonators or electric detonators must never be stored with dynamite, black powders, or other explosives. If a large stock of detonators is carried, a small magazine should be specially erected for it in the same locality as the main magazine but at least 50 yards from it. Sometimes a small outhouse may be adapted for the exclusive storage of detonators, and if sufficiently removed from other buildings is suitable for, say, 20,000 detonators. Any such place which may be approved for keeping more than 2,000 detonators is technically a "magazine" and can be covered in the same licence as is given for the main magazine.

Detonating fuses such as Cordeau-Bickford and Primacord must *not* be kept with detonators, but should be stored in the dynamite magazine. Ordinary Safety Fuse should be kept

apart from detonators. It may be stored either with the dynamite or in an unlicensed building which has been selected with due regard to fire hazard. It is important that safety fuse be kept dry and not subjected to extremes of temperature.

KEEPING OF RECORDS

A careful account should be kept of the receipts of all explosives to the magazine and every issue from it, and care taken to keep the maximum stock within the limit allowed by licence.

A magazine keeper who issues explosives to shotfirers should keep a record of the number of sticks of blasting explosives and the number of detonators given out, check the numbers issued with what has been used and returned. Every precaution should be taken to ensure that no explosives have been "mislaidd" or lost in the open, as such may be the cause of subsequent accident.

Magazine operators who store explosives for sale to the public and operators of Registered Premises are required by regulations under the Act to keep a record of all sales. The record should show the date of the transaction, the name and address of the purchaser, and the quantity and kind of explosives sold.

LICENSING OF MAGAZINES

If a magazine is used solely for the keeping of explosives at a mine or quarry which is subject to inspection by provincial government officials, its building and maintenance is governed by regulations made under the statutes of the province. Not all provinces, however, assume this jurisdiction, and among those which do, there is a variation in the definition of the term "mine", and therefore in the class of mine or quarry magazines liable to provincial government inspection. All magazines not covered by provincial government inspection, except naval and military magazines, are required to be licensed under The Explosives Act. This applies to all magazines owned or operated by merchants selling explosives, or by persons keeping the explosives for their own use—other than in a mine or quarry as above. The issue by a provincial government of licence to sell explosives does not absolve the dealer from obtaining a federal licence for his magazine as required by The Explosives Act.

The fee for these licences is \$2.00 yearly, but their issue is conditional on the magazine being found suitable for the purpose, and on its maintenance in accordance with the regulations. Anyone desiring to establish a magazine and obtain a licence should communicate with the Chief Inspector of Explosives, Department of Mines and Technical Surveys, Ottawa, indicating briefly the type of magazine proposed, its location, and the maximum quantity to be stored in it. Instructions can then be given regarding the procedure to be followed. When first making application for a magazine licence, mention should be made of detonators. This is apt to be overlooked, but it is well to obtain instructions about the storage of detonators at the same time—even if the number to be kept is not sufficient to require a licensed building.

REGISTERED PREMISES

Merchants or others who desire to store a small quantity of explosives for retail sale to casual users, such as farmers, but whose turn-over would not justify the expense of erecting and maintaining a magazine, may have their premises registered for the storage and sale of explosives, provided that such premises are found suitable. The quantities which may be stored in "Registered Premises" are limited to not more than 175 pounds of blasting explosives and not more than 6,000 detonators. An annual fee of \$1.00 is charged for a certificate for Registered Premises and application should be made to the Chief Inspector of Explosives.

The safety measures required for the storage of small quantities of explosives in Registered Premises are the same as those for magazines but smaller storage arrangements suffice. The distance of the storage place from streets, railways, inhabited houses, places of business and other vulnerable points is still important although less so than for larger quantities. A small detached building or a substantial bin-type structure (see Appendix C) is satisfactory, provided it is completely weather-proof and securely locked. A receptacle may sometimes be kept in an already existing warehouse but the warehouse must not be used for the storage of flammable liquids or combustible material. Separate storage must be provided for detonators, well removed from blasting explosives. A locked box suitably marked and kept in a locked warehouse is generally satisfactory.

Operators of Registered Premises like magazine operators, are required to keep careful up-to-date records of all receipts and sales of explosives.

It is an offence under The Explosives Act for any person to sell blasting explosives or detonators, unless he is the owner or occupant of a licensed factory, licensed magazine, or Registered Premises.

THE KEEPING OF SMALL QUANTITIES OF EXPLOSIVES

Holders of small quantities of explosives such as foreman of construction or logging operations, prospectors, farmers, etc., far outnumber those who are *licensed* to store explosives. Although such persons may hold less than the licensed persons, the danger and effects of accidental explosion are vastly greater, because the precautions they take and their methods of holding are often grossly inadequate. Thus, the explosion of a small, individually held quantity may do infinitely more damage than that of a comparatively larger quantity in a magazine under controlled conditions. In recent years there has been no explosion or fire in a *licensed* magazine save when a magazine was destroyed by bush fire, no one being injured. But explosions have occurred in unlicensed places and have caused loss of life and serious injury because they had been left entirely unprotected, inviting accident. Prevention of such accidents does not require technical knowledge; it merely calls for common sense in the separate and secure keeping of explosives, the avoidance of the use of such unsuitable tools as axes, nail pullers, jimmies, wrecking tools and the like in opening cases; the prohibition of smoking or carrying of naked lights in their vicinity; and the cultivation of cleanliness and orderliness in everything connected with explosives.

Neglect to safeguard and to account for all explosives also makes possible accidents of another class which are far too common. In the annual report of the Explosives Division, Department of Mines and Technical Surveys, a summary of accidents is published each year. The high proportion of accidents brought about by playing with explosives is striking. Here are three typical examples taken from the most recent report:

Two 9-year-old boys found some dynamite caps in a trailer owned by a construction company. They inserted a

lighted match in the open end of one cap and it exploded, causing one boy to lose a thumb and three fingers and the other boy to receive burns.....

Two young boys were injured, one seriously, playing with blasting caps. They found several near a vacant lot and built a fire into which they threw the caps. The caps exploded, blinding one boy with flying fragments and causing injuries to the other boy.....

A 12-year-old boy found some detonators in an alley and tried to set them off. While holding one in his hand it exploded, causing serious injury to his right eye, and thumb, index and ring finger of his left hand.....

From 1945 to 1954 inclusive, there were 365 accidents of this sort, out of a total of 1324. These 365 accidents resulted in the death of 59, and injuries to 501. Nearly all the casualties were children who had "found" explosives and, not unnaturally, played with them. The explosives involved may have been lost and forgotten, or were merely being *kept by their owners without proper safeguard*.

Carelessness that results in explosives being left exposed cannot be condoned. It constitutes a violation of the regulations under the Act, whether it is a question of the manner of keeping explosives in licensed magazines, or of the proper custody of small quantities elsewhere. Owners or operators of registered premises are rarely at fault in this respect. Their arrangements for storage are of a more or less permanent character; they are known and subject to inspection.

Statistics prove that most accidents result from the carelessness or lack of awareness of the small user. Parties engaged on such work as road construction, excavations, sewers etc. require relatively small quantities of explosives for a short time but their methods are usually casual and their storage arrangements dangerously inadequate.

The same general provisions that apply to magazines, as detailed in the first few chapters of this booklet, apply to the storage of small quantities of explosives. The small user should never forget that *he is liable to inspection*. The explosives should be locked up in an outer container, the detonators being in a separate locked box. There should be no difficulty in finding a place for the receptacle well clear of, but convenient to, the work—say, 100 yards distant. In all cases the greatest care should be taken to keep a tally of the sticks of dynamite and the number of detonators issued for use and returned, so that none may be

left on the ground after the work is finished. In the same way the returns, by detached parties, to a main store, should be checked up. Not only have stray dynamite cartridges or detonators been picked up long after operations have ceased in a locality, but explosives have been found in bulk. If not wanted they should be destroyed.

Large boxes or chests, commonly used by contractors on road and municipal work, are very frequently used for the keeping of explosives. This is satisfactory if the box is used solely for the dynamite or powder, kept locked, and marked "explosives". Too often this type of chest has been found to contain dynamite, detonators, and miscellaneous tools—a stage well set for accidental explosion.

Farmers and others whose need for explosives may be temporary or recurrent are in a position to select a place of storage available whenever required. Sometimes a small outhouse may be used, or a compartment built in a shed not used for keeping combustible material. However, the building of a small separate hut or bin-type structure (*see* Appendix C) sufficiently large to contain three cases need not involve much labour. Whichever course is followed the place selected should be 100 yards from a dwelling house, but easy of access and supervision.

The danger the small user has to fear is seldom theft, or accident to himself; it is permitting explosives to fall into the hands of others of his household. Too frequently explosives have been put away, but not locked up, in some presumably safe place, only to be brought to light by children, with tragic consequences. The first care, therefore, should be to see that the explosives are kept under lock and key.

APPENDIXES

A. Table of Distances

B. Plans for Magazines

C. Magazine for Small Quantities

APPENDIX A

ABSTRACT FROM REVISED BRITISH TABLE OF DISTANCES

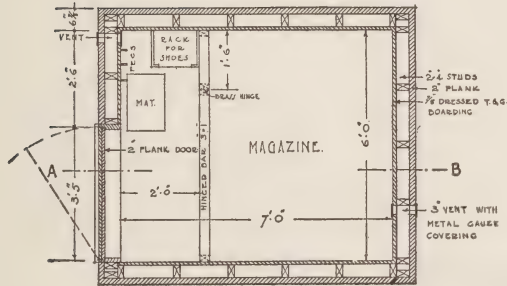
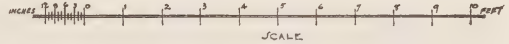
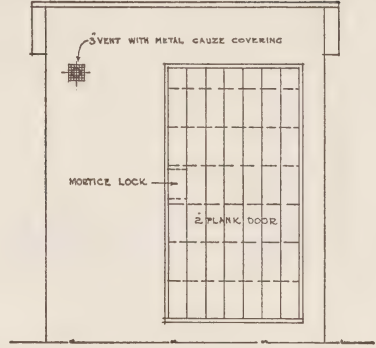
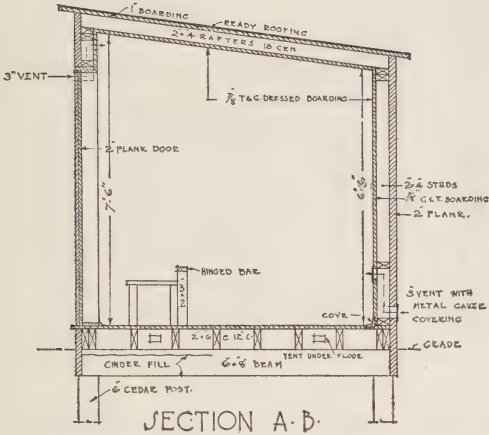
Quantity of Explosives in pounds.	Distance from railway, public highway, canal or other navigable water, open place of resort where people may assemble.	Distance from dwelling house, retail shop, church, school, or other building where people may assemble.
Pounds	Feet	Feet
100 or less	75	75
200	75	100
400	80	159
600	104	208
800	126	252
1,000	146	292
2,000	230	459
3,000	296	592
4,000	352	704
5,000	400	800
6,000	441	882
8,000	509	1,018
10,000	565	1,129
15,000	668	1,335
20,000	745	1,490
30,000	863	1,725
40,000	953	1,906
50,000	1,030	2,060

This table furnishes the basis on which applications for licences will be considered. The table is susceptible however to modifications under special circumstances, at the discretion of an Inspector of Explosives.

APPENDIX B

MAGAZINE FOR EXPLOSIVES

PLAN No. 1

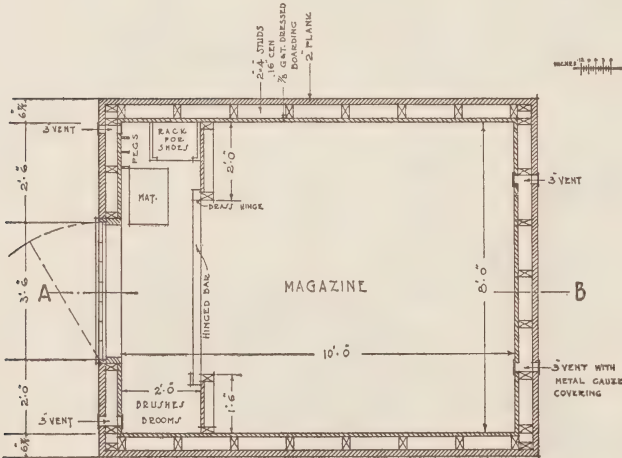
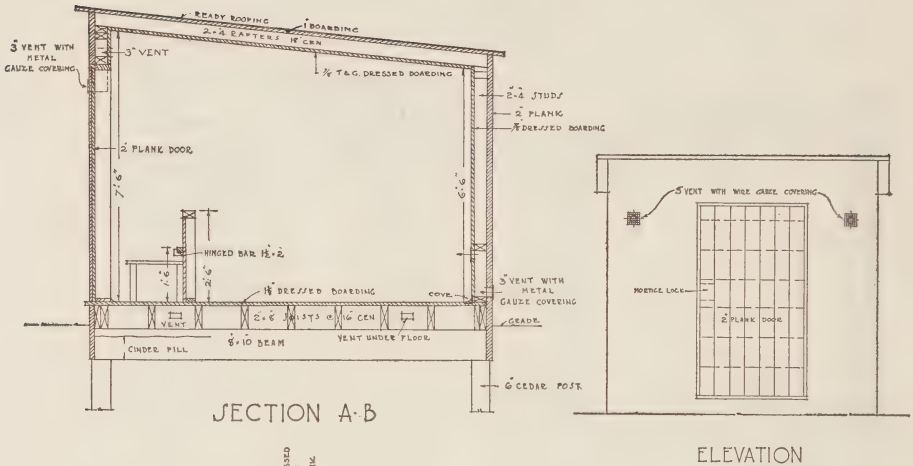


Double-walled wood magazine does not give protection against chance rifle shots or offer serious obstruction to forcible entry. It is suitable only where there is little danger of rifle fire and when located within easy observation of the owner.

PLAN

Capacity 75 cases, with cases piled not more than five high. For 100 cases (approx. 5,000 pounds) two feet should be added to length. (Divide total number of cases by number of tiers (5) and multiply by two to give floor space required.) In districts with a heavy snowfall the pitch of the roof may be increased.

PLAN No. 2



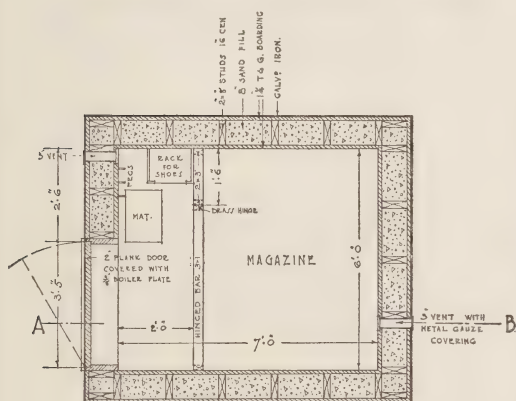
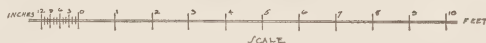
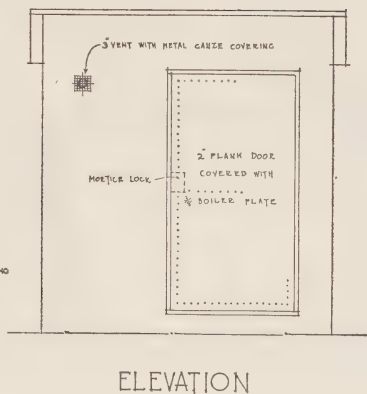
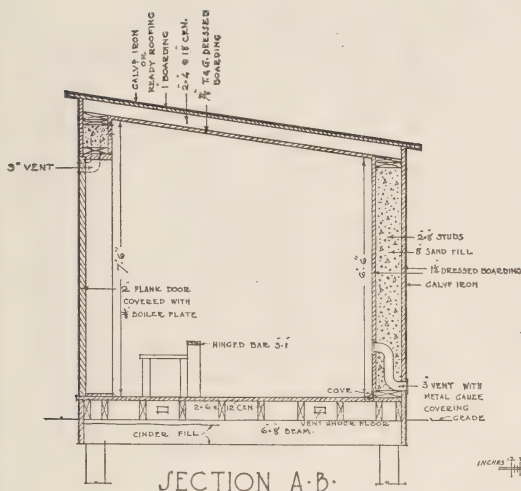
PLAN

Double-walled wood magazine does not give protection against chance rifle shots or offer serious obstruction to forcible entry. It is suitable only where there is little danger of rifle fire and when located within easy observation of the owner.

Capacity 8,000 pounds, with cases piled not more than five high. If accommodation is required for larger stocks, design should be suitably altered to give proportionately increased floor space. (Divide total number of cases by number of tiers (5) and multiply by two to give floor space required.) In districts with a heavy snowfall the pitch of the roof may be increased.

MAGAZINE FOR EXPLOSIVES

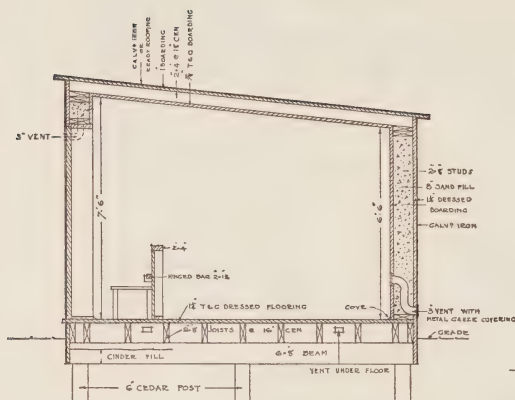
PLAN No. 3



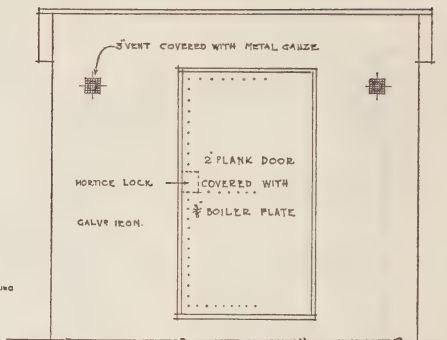
Double-walled wood magazine with sand filling and shielded door gives reasonable security, for a semi-permanent magazine, against chance rifle shots and forcible entry.

Capacity 75 cases, with cases piled not more than five high. For 100 cases (approx. 5,000 pounds) two feet should be added to length. (Divide total number of cases by number of tiers (5) and multiply by two to give floor space required.) In districts with a heavy snowfall the pitch of the roof may be increased.

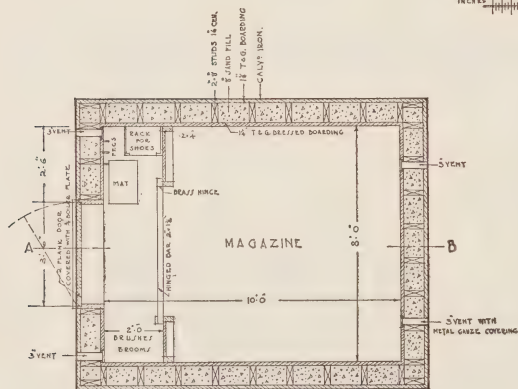
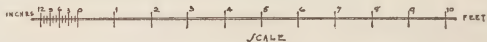
PLAN No. 4



SECTION A. B.



ELEVATION



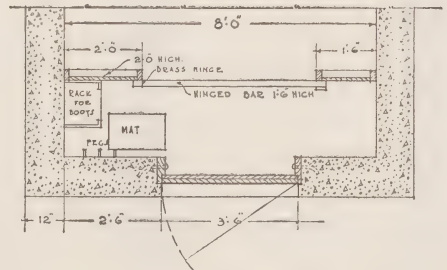
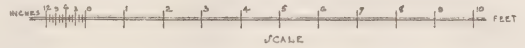
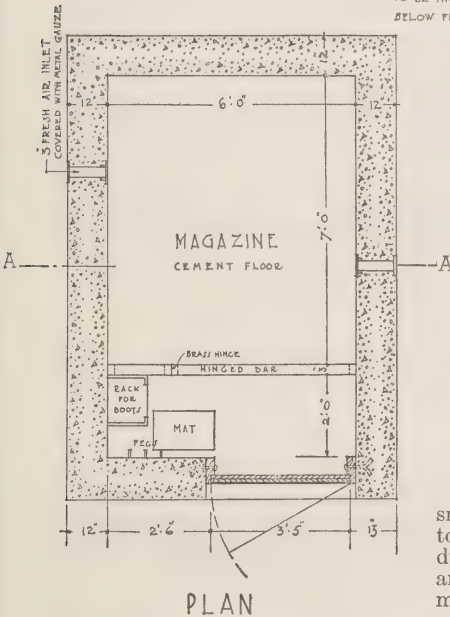
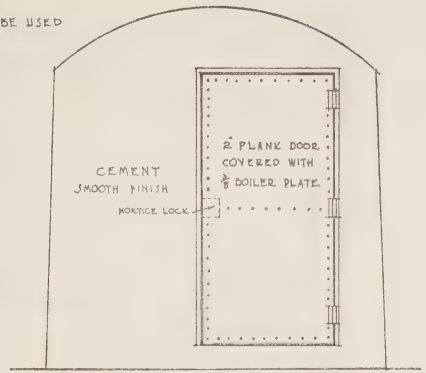
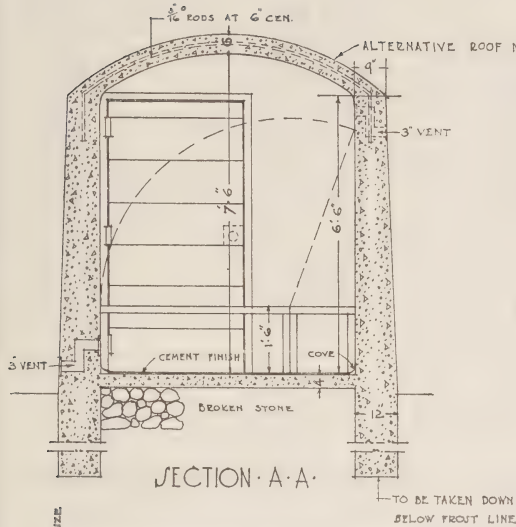
PLAN

Double-walled wood magazine with sand filling and shielded door, gives reasonable security, for a semi-permanent magazine, against chance rifle shots and forcible entry.

Capacity 8,000 pounds with cases piled not more than five high. If accommodation is required for larger stocks, design should be suitably altered to give proportionately increased floor space. (Divide total number of cases by number of tiers (5) and multiply by two to give floor space required.) In districts with a heavy snowfall the pitch of the roof may be increased.

MAGAZINE FOR EXPLOSIVES

PLAN No. 5—(Concrete)

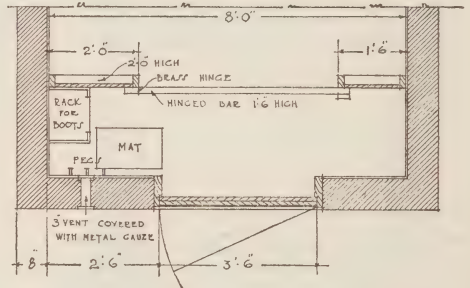
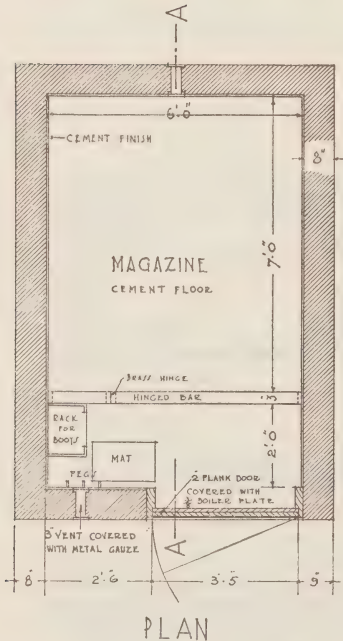
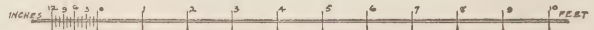
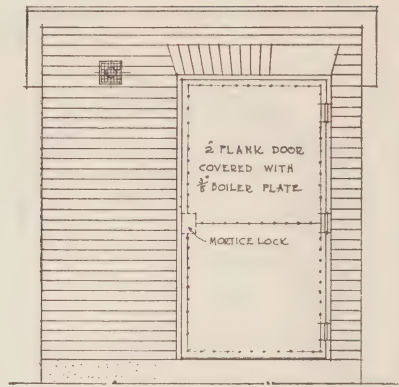
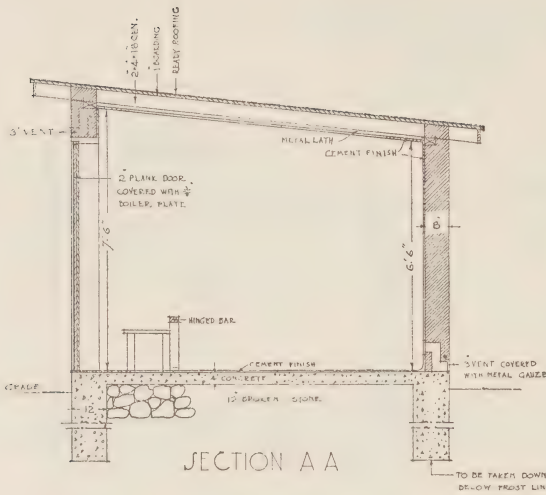


Floor and inner surface of walls to have smooth finish of clean cement. As an alternative to smooth finish on floor and for greater durability a smooth wood floor may be provided and if preferred, the required smooth interior may be obtained by wood lining to walls.

Capacity 5,000 pounds (100 cases piled not more than five high). For large quantities divide total number of cases by number of tiers (5) and multiply by two to give floor space required. In districts with a heavy snowfall the pitch of the roof may be increased.

MAGAZINE FOR EXPLOSIVES

PLAN No. 6—(Brick)

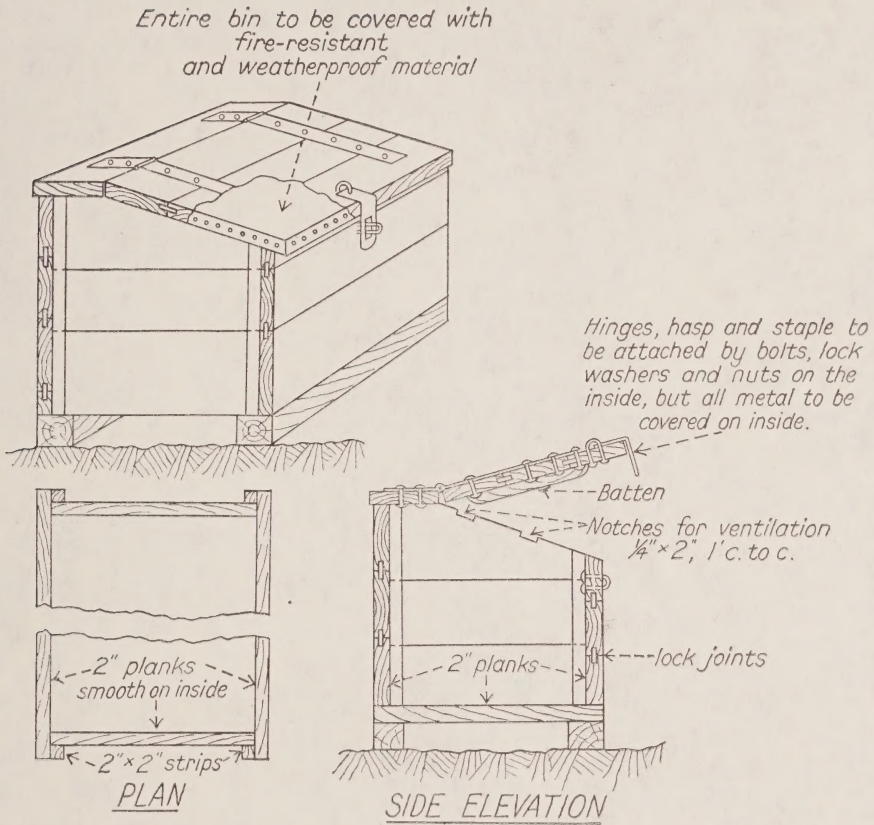


SUGGESTED ARRANGEMENT FOR ENTRANCE IN THE CASE OF A WIDER MAGAZINE

Floor and inner surface of walls to have smooth finish of clean cement. As an alternative to smooth finish on floor and for greater durability a smooth wood floor may be provided and if preferred, walls may also have smooth wood lining.

Capacity 5,000 pounds (100 cases piled not more than five high). For larger quantities divide total number of cases by number of tiers (5) and multiply by two to give floor space required. In districts with a heavy snowfall the pitch of the roof may be increased.

APPENDIX C



BIN FOR STORAGE OF SMALL QUANTITIES OF EXPLOSIVES

Don't hide explosives—lock them up.

Don't keep explosives with tools.

Don't keep detonators and blasting explosives together.

Don't leave explosives accessible to children.

Don't smoke or have fire or naked lights near explosives.

Don't neglect to check all explosives issued, used, and left over each day.

Don't forget to lock up unused explosives.

Don't keep deteriorated explosives, destroy them in a safe manner.